



## PUBLIC PAGE

### Quarterly Report

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Prepared for: United States Department of Transportation  
Pipeline and Hazardous Materials Safety Administration  
Office of Pipeline Safety

Project Title: "Consolidated Research and Development Program to Assess the Structural Significance of Pipeline Corrosion"

Prepared by: Mr. Vinod Chauhan  
Principal Investigator  
Advantica, Inc.  
Ashby Rd.  
Loughborough, LE11 3GR, England  
[vinod.chauhan@advanticagroup.com](mailto:vinod.chauhan@advanticagroup.com)

Mr. Ian Wood  
Team Project Manager  
Electricore, Inc.  
27943 Smyth Drive, Suite 105  
Valencia, CA 91355  
[ian@electricore.org](mailto:ian@electricore.org)

Mr Mark Piazza  
Team Technical Coordinator  
Pipeline Research Council International, Inc.  
1401 Wilson Blvd, Suite 1101  
Arlington, VA 22209  
[mpiazza@prci.org](mailto:mpiazza@prci.org)

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## **Introduction**

Metal loss due to localized corrosion and pitting of pipelines can significantly increase the risk of rupture. Therefore, it is vitally important to accurately determine the residual strength of corroded pipelines so that proper remedial actions may be taken to avoid catastrophic events. While historical methods and practices for inspection and integrity assessment have led to an overall safe and reliable pipeline infrastructure with a very low frequency of failures, public expectations concerning pipeline safety are growing, and industry is committed to pursuing further improvements. Consequently, new US regulations and sophisticated inspection technologies have resulted in operators having large quantities of data that are often difficult to practically apply within the framework of existing assessment guidelines. Clearly, the industry needs a technically sound, comprehensive and integrated approach to assess and mitigate the effects of localized corrosion in gas and oil pipelines, and to assure appropriate pressure-containment safety margins.

Several methods have been developed for assessment of corrosion defects, such as ASME B31G, RSTRENG and LPC. These methods were developed using an early fracture mechanics relationship for toughness-independent failure of pressurized pipes and were empirically calibrated against a database of full-scale burst tests for thin wall pipes. Some work has already been done to address the limitations of existing assessment methods available to the industry. The objective of this project is to develop simplified guidance to assess corrosion metal loss defects in pipelines of material strengths up to Grade X100.

## **Summary of Progress – Project 153H**

The following progress has been made this quarter:

1. Non-linear FE models of 48" diameter pipe ( $D/t=61.6$ ) with pit, groove (circumferential and axial) and patch defects have been generated. Failure loci have been generated for grade X100 material under internal pressure-bending moment and axial compressive loading.

## **Plans for Future Activity**

Begin writing the Phase 2 Final Report (Task 18).